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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/417,918 | 10/13/1999 | TAKASHI SASAKI | 086531/0119 | 8124 |

7590 10/06/2003

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EXAMINER

LEUNG, JENNIFER A

ART UNIT PAPER NUMBER

1764

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/417,918

Applicant(s)

SASAKI ET AL.

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7,10,11 and 23-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7,10 and 23 is/are allowed.
- 6) ☒ Claim(s) 11 and 24-33 is/are rejected.
- 7) ☒ Claim(s) 23 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 11, 2003 has been entered.

Response to Amendment

2. Applicant's amendment submitted on June 13, 2003 (entered upon filing of the RCE) and the supplementary amendment submitted on July 24, 2003 have been received and carefully considered. Claims 1-6, 8, 9 and 12-22 are cancelled. Claims 24-33 have been added. Claims 7, 10, 11 and 23-33 remain active.

Allowable Subject Matter

3. Claims 7, 10 and 23 contain allowable subject matter. The prior art of record does not disclose or adequately teach the apparatus as instantly claimed by applicant, which comprises the combination of structural elements as recited in independent claim 23.

4. Claim 11 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claim Objections

5. Claims 23 and 33 are objected to because of the following informalities:

- In claim 23, line 14, "and interior" should be changed to -- an interior --.

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- In claim 33, the last line, "tublar" should be changed to -- tubular --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 11 and 24-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 11, the language of the claim is drawn to a method limitation which renders the claim vague and indefinite, as it is unclear as to the additional structural limitation applicant is attempting to recite, since "the second temperature control gas" and "the first temperature control gas" are not considered elements of the apparatus, and the specific temperatures of the respective gases are considered process limitations.

Regarding claim 24, the phrase "gas can exclusively flow" (line 10) is considered vague and indefinite, since whether the gas "can" exclusively flow does not constitute a positive structural limitation. Also, "the gas flow inlet" and "the gas flow outlet" (lines 11, 12; also in claim 27, lines 3-4) lack proper positive antecedent basis. Also, "fan-shape member" and "fan-shaped members" (lines 15, 17; also in claim 26, lines 3-4) lack proper positive antecedent basis.

Regarding claim 28, the language of the claim is drawn to a method limitation which renders the claim vague and indefinite, as it is unclear as to the structural limitation applicant is attempting to recite, since "the first and second control fluids" are not considered elements of the apparatus. Also, "the gaseous component" lacks proper positive antecedent basis.

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Regarding claim 29, "the first and second sectors" (lines 4-5) lack proper positive antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 24, 27, 29 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Imamura (U.S. 4,391,616).

Regarding claim 24, Imamura (see FIG. 8-11; column 8, lines 4-38; column 9, lines 1-31) discloses an apparatus comprising:

an outer casing (comprising frame member **25**, etc.) having axially opposite ends and a curved side wall;

a gas inlet (pipe **25a**) formed in one of the axially opposite ends and a gas outlet (pipe **25b**) formed in the other of the axially opposite ends, the gas inlet **25a** and gas outlet **25b** being essentially axially aligned with one another; and

a plurality of hollow fan-shaped blocks (moisture absorbing elements **20**) which are assembled in a circular rotating body that is disposed inside the casing **25**, the hollow fan shaped blocks **20** each having:

a hollow interior (air passages **20c**);

axially opposed openings through which gas **A1/A2** can exclusively flow from the gas flow inlet **25a** to the gas flow outlet **25b** via the interior **20c** when the fan-shaped

block **20** rotates into a position between the gas flow inlet **25a** and gas flow outlet **25b** (i.e., when rotated to the position of regeneration means **G**); and

external radially extending side surfaces (i.e., flat separation sheets **20b**) which are each arranged opposite and spaced from an external radially extending side surface of an adjacent fan-shape member (i.e., flat separation sheets **21b**) so as to form a plurality of radially extending passages (air passages **21c** of air passing element **21**, for gas stream **D1/D2**) which each extend between two adjacent fan-shaped blocks **20** and which are each fluidly isolated from the interiors **20c** of the hollow fan shaped members **20**.

Regarding claim 27, Imamura (FIG. 8-11; column 7, lines 25-60) discloses an absorbent material disposed in the interiors **20c** of the fan-shaped blocks **20**.

Regarding claim 29, Imamura (FIG. 8-11; column 9, lines 2-6) discloses a gaseous component exhaust port (for discharging dry or dehumidified gas **C2**, such as an outlet duct **24b** shown in FIG. 12) formed in at least one axial end for venting the gaseous component released from the absorbent material in the fan-shaped blocks which have rotated into a second position.

Regarding claim 32, Imamura (see FIG. 8-11; column 8, lines 4-38; column 9, lines 1-31) discloses an apparatus comprising:

a circular rotating body formed of a plurality of fan shaped blocks (moisture absorbing elements **20**), each of the blocks **20** having opposed open flat faces in which openings (air passages **20c**) are respectively formed which permit gas **A1/A2** to flow through a hollow interior **20c** of the block **20**, each block **20** having non-perforate curved inner and outer edges (see Fig. 8) and non-perforate flat sides (defined by flat separation sheets **20b** and **21b**) which are angled with respect to one another, the non-perforate flat sides **20b/21b** cooperating to define

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temperature adjustment passages (air passages **21c**) through which temperature adjusting fluids flow and exclusively contact external surfaces of the blocks **20** and change the temperature of the blocks **20**; and a casing (comprising frame member **25**, etc.) in which the rotating body is disposed, the casing **25** having first and second axial ends in which a gas inlet port (pipe **25a**) and a gas outlet port (pipe **25b**) are respectively formed so that gas **A1/A2** flows axially through a segment of the housing **25** and through the fan shaped blocks **20** which rotate in the segment (i.e., when rotated to the position of regeneration means **G**).

Instant claims 24, 27, 29 and 32 structurally read on the apparatus of Imamura.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 25, 28 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imamura (U.S. 4,391,616) in view of Chang et al. (U.S. 3,446,031).

Regarding claims 25, 28 and 33, Imamura (FIG. 8-11; column 10, lines 7-30) discloses a stationary tubular member (i.e., cooling air duct **31**) disposed coaxially along an axis about which the rotating body is rotatable, for defining an elongate passage (central hollow portion **22**)

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that carries a temperature control fluid through the temperature adjustment passages (air passages **21c**) and out through exhaust duct **31d**. However, Imamura is silent as to whether the tubular member **31** may be divided into two halves, such that a first and a second elongate passage is formed, for carrying, respectively, a first and a second temperature control fluid through a first and a second zone or sector of the temperature adjustment passages **21c**. Chang et al. (FIG. 1-2; column 2, line 65 to column 3, line 23) teach a moisture adsorption apparatus comprising a rotating wheel **10**, wherein a stationary, tubular member (inner wall **12**) is disposed coaxially along an axis about which the wheel **10** is rotatable, for defining first and second elongate passages (chambers **22a**, **22b**) wherein first and second temperature control fluids may flow, respectively, to first and second temperature control passage zones (i.e., as illustrated in the Figures, either the left or the right side of wheel **10**). It would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to modify the apparatus of Imamura to comprise a divided, stationary tubular member, to provide an additional temperature control fluid carrying passage for enabling separate temperature control for a given zone or sector of the rotating body, as taught by Chang et al.

9. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imamura (U.S. 4,391,616) in view of Chang et al. (U.S. 3,446,031), as applied to claim 25 above, and further in view of Miller (U.S. 2,286,920).

Although the collective teachings of Imamura and Chang are silent as to the apparatus further comprising the recited stationary sealing members, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide such sealing members to the modified apparatus of Imamura, on the basis of suitability for the intended use, because the

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use of such sealing members, i.e., for the purposes as disclosed by applicant, in rotary bed gas separators is conventionally known in the art, as evidenced by Miller. Miller (FIG. 1; page 2, first column, lines 1-26) teach a gas separator comprising a plurality of stationary sealing members **18**, **19** and **20**, wherein sealing member **18** engages the inboard curved edge of circular rotating body, and sealing members **19** and **20** engage the outboard curved edge of the rotating body, to define a first and a second treatment zone (i.e., corresponding to dehydrating chamber **21** and reactivating chamber **22**).

10. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imamura (U.S. 4,391,616) in view of Gidaspow et al. (U.S. 3,865,924).

Regarding claim 30, Imamura (FIG. 8-11; column 8, lines 4-38; column 9, lines 1-31) discloses an apparatus comprising:

an outer casing (comprising frame **25**, etc.) having an axis and first and second axial ends in which a gas inlet (pipe **25a**) and a gas outlet (pipe **25b**) are respectively formed;

a rotating body comprised of a plurality of hollow blocks (moisture absorbing elements **20**) disposed inside the casing **25** so as to be rotatable about the axis of the outer casing, each of the hollow blocks **20** having openings in opposed faces of the blocks, which faces extend normally to the axis of the outer casing;

a temperature responsive absorption/releasing material (column 7, lines 25-60) disposed on an inner surface of the hollow blocks **20** and adapted to absorb and release moisture; and

a first flow path means (defined by air passages **20c**) formed inside the rotating body for directing an essentially unrestricted flow of gas **A1/A2** axially through the casing **25** from the gas inlet **25a** to the gas outlet **25b**, and through the openings in the hollow blocks **20** which are

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located between the outer casing; and

a second flow path means (defined by air passages **21c**) which is fluidly separate from the first flow means (column 9, line 12-15) for feeding at least one temperature adjusting fluid **D1/D2** through a selected portion of the rotating body and over only the external surfaces (i.e., through elements **21**, which are defined by plates **20b/21b**) of the hollow blocks **20**, said second flow path means **21c** establishing different temperature zones (i.e., by cooling hollow blocks **20**) within the casing depending on a rotational position of the rotating body within the casing.

Imamura, however, is silent as to whether the disclosed moisture absorption/releasing material may comprise a carbon dioxide absorption/releasing material. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide a carbon dioxide absorption/releasing material for the moisture absorption/releasing material in the apparatus of Imamura, on the basis of suitability for the intended use and absent showing any unexpected results thereof, since the use of rotary bed gas separators, such as the one disclosed by Imamura above, for the separation of carbon dioxide from mixed gas streams is well known in the art, as evidenced by Gidaspow et al. Gidaspow et al. teach a carbon dioxide absorption/releasing material (i.e., an alkali metal carbonate) that is particularly suitable for use in an apparatus comprised of a wheel **9**, rotatably mounted on a shaft **7**, wherein the wheel **9** may comprise corrugated layers divided into a regeneration zone **15** and an absorption zone **16** (FIG. 2-4; column 9, line 24 to column 10, line 60).

Regarding claim 31, Imamura discloses the openings in the opposed faces of the blocks **20** provide exclusive fluid communication with an interior **20c** of each of the hollow blocks (FIG. 8 and 10; column 9, lines 13-15).

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Response to Arguments

11. Applicant's arguments with respect to claims 7, 10, 11 and 23-33 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951.

The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung

September 25, 2003 


HIEN TRAN
PRIMARY EXAMINER